PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Clean Coal Power Initiative (CCPI)

07/2003

DEMONSTRATION OF INTEGRATED OPTIMIZATION SOFTWARE AT THE BALDWIN ENERGY COMPLEX

CONTACT

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PARTICIPANT

NeuCo, Inc.
Boston, MA

LOCATION

Baldwin Energy Complex
Baldwin, IL

TOTAL ESTIMATED COST

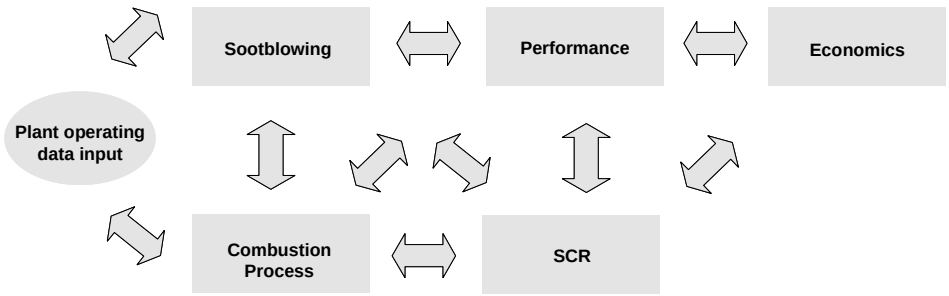
$18,640,231

COST SHARE

DOE	$ 8,388,104
Participant	$ 10,252,127

Project Description

NeuCo, Inc. of Boston, Massachusetts plans to design and demonstrate integrated on-line optimization systems at Dynegy Midwest Generation's Baldwin Energy Complex, which consists of three 600 MW coal-fired units located in Baldwin, Illinois.The control modules to be developed will address cyclone combustion, sootblowing, selective catalytic reduction (SCR) operations, overall unit thermal performance, and plant-wide economic optimization. This project will build on NeuCo's ProcessLink™ technology platform that includes neural networks, genetic algorithms, and fuzzy logic techniques. These capabilities will be used to apply optimization techniques to a variety of systems within coal power plants using existing control technologies and then link these systems to each other. The project will provide solutions that use system-specific optimization applications, interfacing with operators, sensors and actuators, and a proprietary optimization engine. The overall architecture of this control platform is designed to permit flexible deployment strategies. Rather than requiring that all data and logic be resident on a single computer, the service model allows applications to leverage networked computational resources. Thus, core to the design principles to be used for the project is an application architecture built around interoperable services to provide high-value process management and business logic, which will result in more efficient plant operations. The integration concept planned is depicted in the following figure:



Demonstration of Integrated Optimization Software at the Baldwin Energy Complex

ESTIMATED PROJECT DURATION

48 months

CUSTOMER SERVICE

800-553-7681

WEBSITE

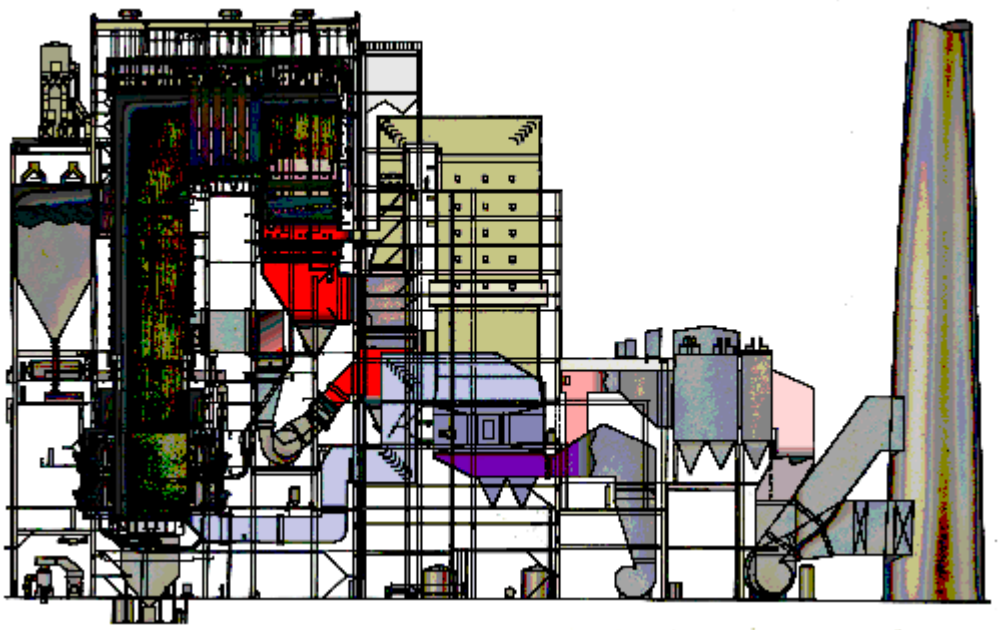
www.netl.doe.gov

Benefits

When completed, this project will demonstrate the applicability of integrating the on-line optimization system with power plant operations to increase the thermal efficiency, fuel efficiency and reliability of the plant, while achieving a corresponding reduction of airborne emissions such as NOx, CO_2, mercury, and particulates. Optimization results are inherently unit-specific, however, reasonable targets for the integrated set of modules are to meet or exceed:

- Furnace NOx reduction improvement by 5%,
- Heat rate immprovement by 1.5%,
- Increase of an annual MWh output by 1.5%,
- Commensurate reductions in greenhouse gases, mercury, and particuates; and
- Commensurate increases in profitability from lower costs, improved reliability, and greater commercial availability.

As plant complexity increases through retrofit and repowering applications, the introduction of new technologies, and plant modifications, this integrated process optimization approach can be an important tool to support a plant operator's control objectives and link them to corporate objectives of increased efficiency and lower emissions.



Dynegy Midwest Generation's Baldwin Energy Complex